UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/575,217 | 05/07/2007 | Christof Niehrs | 025953-001 | 6923 |

24239 7590 09/18/2009

MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

| EXAMINER | |
|---|---|
| MARVICH, MARIA | |
| ART UNIT | PAPER NUMBER |
| 1633 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 09/18/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/575,217 | NIEHRS ET AL. | |
| | Examiner | Art Unit | |
| | MARIA B. MARVICH | 1633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *1* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *16 and 17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-15 and 18-20* are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

Claims 1-20 are pending in this application and subject to restriction. Claims 16 and 17 have not been subjected to restriction requirement, as the meanings of the claims are so unclear. Specifically, claim 16 is an improper multiple dependent claims that does not refer to the claims in the alternative. Claim 17 is withdrawn due to its dependence on claim 16.

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I-IV. Claims 1, 3 and 6, drawn to a nucleic acid, complement or variant of the nucleotide sequence encoding Futrin 1, 2, 3 *or* 4, classified in class 435, subclass 320.1.

V-VIII. Claims 1 and 6, drawn to Futrin 1, 2, 3 *or* 4 polypeptide or a fragment thereof, classified in class 530, subclass 350.

IX-XII. Claims 1, 2 and 4-6, drawn to a ligand for Futrin 1, 2, 3 *or* 4, classified in class 530, subclass 387.9.

XIII-XVI. Claims 7, 8, 9 and 18, drawn to a method for diagnosing diseases using a nucleic acid, complement or variant of the nucleotide sequence encoding Futrin 1, 2, 3 *or* 4 and/or Futrin 1, 2, 3 *or* 4 or a fragment thereof and/or a ligand for Futrin 1, 2, 3 *or* 4, classified in class 435, subclass 4.

XVII-XX. Claim 10, drawn to a method of identifying a binding partner for a Futrin 1, 2, 3 *or* 4 polypeptide, classified in class 435, subclass 8.

XXI-XXIV. Claim 11, drawn to a method of identifying activators/agonists or inhibitors/antagonists for a Futrin 1, 2, 3 *or* 4 polypeptide, classified in class 435, subclass i.e. 7.71.

XXV-XVIII. Claim 12, drawn to a method of obtaining and identifying drug candidates for diseases associated with aberrant expression of Futrin 1, 2, 3 *or* 4 by detecting presence or absence of a single or increase of a signal, classified in class 435, subclass 7.7.

XXIX-XXXII. Claim 13, drawn to activators/agonists or inhibitors/antagonists for Futrin 1, 2, 3 *or* 4 polypeptide, classified in class 514, subclass 1.

XXXIII-XXXVI. Claim 14 and 15, drawn to a pharmaceutical composition that modulates expression of Futrin 1, 2, 3 *or* 4, classified in class 435, subclass 7.1.

XXXVII-XL. Claim 19 and 20, drawn to a method of preparing a pharmaceutical composition comprising Futrin 1, 2, 3 *or* 4 nucleic acid, classified in class 544, subclass 44.

XLI-XLIV. Claim 19 and 20, drawn to a method of preparing a pharmaceutical composition comprising Futrin 1, 2, 3 *or* 4 polypeptide, classified in class 544, subclass 2.

XLV-XLVIII. Claim 19 and 20, drawn to a method of preparing a pharmaceutical composition comprising Futrin 1, 2, 3 *or* 4 binding partner, classified in class 544, subclass 1.

The inventions are distinct each from the other because of the following reasons:

Inventions of Group I-IV and Group V-VIII are directed to related products. The related inventions are distinct if the (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the inventions as claimed are related in that the nucleic acid of Group I-IV *can* encode a polypeptide of Group V-VIII. However, Polypeptides, which are composed of amino acids, and polynucleotides, which are composed of purine and pyrimidine units, are structurally distinct molecules; any relationship between a polynucleotide and polypeptide is dependent upon the information provided by the nucleic acid sequence open reading frame as it corresponds to the primary amino acid sequence of the encoded polypeptide. In the present claims, a nucleic acid of group I-IV does not necessarily encode a protein of group V-VIII. Furthermore, the information provided by the nucleic acid of group I-IV can be used to make a materially different protein than that of group V-VIII. In addition, while a polypeptide of group V-VIII can made by methods using some, but not all, of the polynucleotides that fall within the scope of group I-IV, it can also be recovered from a natural source using by biochemical means. For instance, the polypeptide can be isolated using affinity chromatography. For these reasons, the inventions of Groups I-IV and V-VIII are patentably distinct. Furthermore, the inventions as claimed do not encompass overlapping subject matter and there is nothing of record to show them to be obvious variants.

Furthermore, searching the inventions of Groups I-IV and V-VIII together would impose a serious search burden. In the instant case, the search of the polypeptides and the

polynucleotides are not coextensive. The inventions of Groups I-IV and V-VIII have a separate status in the art as shown by their different classifications. In cases such as this one where descriptive sequence information is provided, the sequences are searched in appropriate databases. There is search burden also in the non-patent literature. Prior to the concomitant isolation and expression of the sequence of interest there may be journal articles devoted solely to polypeptides, which would not have described the polynucleotide. Similarly, there may have been "classical" genetics papers, which had no knowledge of the polypeptide but spoke to the gene. Searching, therefore is not coextensive. As such, it would be burdensome to search the inventions of Groups I-IV and V-VIII together.

Inventions of Group IX-XII and Group V-VIII are directed to related products. The related inventions are distinct if the (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the ligands of group IX-XII are related to the polypeptides of Group V-VIII in that the ligands bind to the polypeptides. However, the polypeptides are otherwise unrelated structurally or functionally with the Furin polypeptides. Furthermore, the inventions as claimed do not encompass overlapping subject matter and there is nothing of record to show them to be obvious variants. In this case, the ligand of group IX-XII is defined in terms of its binding specificity to a Furin polypeptide of group V-VIII. However, the polypeptide binding region must comprise only a substructure of Furin.

Furthermore, searching the inventions of groups V-VIII and IX-XII together would impose a serious search burden. In the instant case, the search of the polypeptides and the ligands that bind them are not coextensive. In fact, the nature of the ligands encompasses a diverse and potentially unrelated group of molecules. As such, it would be burdensome to search the inventions of groups IV-VIII and IX-XII together.

The nucleic acids of group I-IV and the ligand of group IX-XII are unrelated as the nucleic acid does not encode or otherwise interact with one another.

Inventions of Groups I-IV, V-VIII or IX-XII and Groups XIII-XVI are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the methods of I-IV, V-VIII or IX-XII can be used in methods other than in diagnosing. For example, the nucleic acids of Groups I-IV can be used to produce the polypeptides and the polypeptides and ligands of Groups V-VIII or IX-XII and Groups XIII-XVI can be used biochemically i.e. administration to a subject for therapeutic or research purposes.

Searching the inventions of either Groups I-IV, V-VIII or IX-XII and Groups XIII-XVI together would impose serious search burden. The inventions of Groups I-IV, V-VIII or IX-XII and Groups XIII-XVI have a separate status in the art as shown by their different classifications. Moreover, in the instant case, the search for the products (nucleic acids, polypeptides and ligands of Futrin 1,2,3 or 4) and the method of using are not coextensive. Prior art, which teaches a Futrin nucleic acid, polypeptide or ligand would not necessarily be applicable to the method of

using the product. Moreover, even if the product were known, the method of using the product may be novel and unobvious in view of the preamble or active steps.

The nucleic acids of group I-IV and the methods of group XVII-XX are unrelated as the nucleic acid is not used or made by the methods.

Inventions of Groups V-VIII and Groups XVII-XX, XXI-XIV, XV-XVII XXIX-XXXII are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the products of V-VIII can be used in methods other than in identifying a binding partner. For example, the polypeptides can be used biochemically i.e. administration to a subject for therapeutic or research purposes.

Searching the inventions of Groups V-VIII and Groups XVII-XX, XXI-XIV, XV-XVIII and XXIX-XXXII together would impose serious search burden. The inventions of Groups V-VIII and Groups XVII-XX, XXI-XIV, XV-XVIII, XXIX-XXXII have a separate status in the art as shown by their different classifications. Moreover, in the instant case, the search for the polypeptides and the method of using are not coextensive. Prior art, which teaches the polypeptide would not necessarily be applicable to the method of using the product. Moreover, even if the product were known, the method of using the product may be novel and unobvious in view of the preamble or active steps.

Inventions of Groups IX-XII and XVII-XX are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the

process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the binding partner can be made by identifying consensus binding regions with known binding proteins or antibodies or using two hybrid systems.

Inventions of Groups XIII-XVI, XVII-XX, XXI-XIV, XV-XVIII are directed to related processes. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). All the Groups are drawn to methods requiring use of a Futrin polypeptide, however, each method is mutually exclusive, are not capable of use and have a different effect. The method of Groups XIII-XVI require use of Futrin to diagnose disease whereas the method of Groups XVII-XX are drawn to identifying binding partners using Futrin wherein the method inherently requires determining whether the compound has bound to Futrin which is not required of the methods of Groups XIII-XVI, XXI-XIV, XV-XVIII. The method of Groups XXI-XIV are drawn to methods of identifying antagonists or agonist which require assessment of whether the activity of Futrin is altered due to compounds administered. The method of Groups XV-XVIII require use of and detection of a label that is not required of any of the methods of Groups XIII-XVI, XVII-XX, XXI-XIV. Because the methods require distinct effects as well as are not capable of use together, the Inventions of Groups XIII-XVI, XVII-XX, XXI-XIV, XV-XVIII are patentably distinct.

Furthermore, the distinct steps and products require separate and distinct searches. A search for art pertaining to methods of diagnosing disease is distinct from a search of methods of

identifying binding partners and from methods of identifying antagonists or agonists which are distinct from methods of identifying drug candidates. As such, it would be burdensome to search the inventions of Groups XIII-XVI, XVII-XX, XXI-XIV, XV-XVIII together.

Inventions of Groups XXI-XIV and XXIX-XXXII are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the method can be used to identify antibodies or binding partners that do not alter activity.

Inventions of Groups I-IV or V-VIII and Groups XXIX-XXXII or XXXIII-XXXVI are directed to related products. The related inventions are distinct if the (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, activator/inhibitor of Futrin and the polypeptide are related in that the activator/inhibitor function to modulate the activity of Futrin. However, the two are unrelated structurally and functionally. Futrin function is affected by but is not the same as the activity of the inhibitor /activator and hence do not overlap in scope and are not obvious variants. Similarly, the pharmaceutical compounds capable of modulating either expression of futrin nucleic acids are related in that the modulators function to modulate the nucleic acid expression. However, the two are unrelated structurally and functionally. Futrin expression is affected by but

is not the same as the activity of the modulator and hence do not overlap in scope and are not obvious variants.

Furthermore, the distinct products require separate and distinct searches. A search for art pertaining to a compound that is an activator or inhibitor or modulator does not necessarily overlap with a search for a nucleic acid or polypeptide. A search for art for Futrin either in the literature or by sequence search will not necessarily pick up a modulator and a search for art for a modulator will not necessarily pick up the protein or nucleic acid by sequence. As such, it would be burdensome to search the inventions of Groups I-IV or V-VIII and Groups XXIX-XXXII or XXXIII-XXXVI together.

Inventions of Groups I-IV, V-VIII or IX-XII and Groups XXXVII-XL, XLI-XLIV or XLV-XLVIII are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the methods of I-IV, V-VIII or IX-XII can be used in methods other than in preparing a pharmaceutical composition. For example, the nucleic acids of Groups I-IV can be used to produce the polypeptides and the polypeptides and ligands of Groups V-VIII or IX-XII and Groups XIII-XVI can be used biochemically i.e. administration to a subject for therapeutic or research purposes.

Searching the inventions of either Groups I-IV, V-VIII or IX-XII and Groups XXXVII-XL, XLI-XLIV together would impose serious search burden. The inventions of Groups I-IV, V-VIII or IX-XII and Groups XXXVII-XL, XLI-XLIV have a separate status in the art as shown

by their different classifications. Moreover, in the instant case, the search for the products (nucleic acids, polypeptides and ligands of Futrin 1,2,3 or 4) and the method of using are not coextensive. Prior art, which teaches a Futrin nucleic acid, polypeptide or ligand would not necessarily be applicable to the method of using the product. Moreover, even if the product were known, the method of using the product may be novel and unobvious in view of the preamble or active steps.

The remaining products and methods are unrelated as they are neither used in nor made by the recited methods. .

Because these inventions are distinct for the reasons given above, have acquired a separate status in the art as shown by their different classification, and the search required for each group is not required for the other groups because each group requires a different non-patent literature search due to each group comprising different products and/or method steps, restriction for examination purposes as indicated is proper.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provision of MPEP 821.04. Process claims that depend for or otherwise include all the limitations of the patentable produce will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendment submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirements for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 USC 101, 101, 103 and 112. Until an elected product claim is found allowable, an otherwise proper restriction between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See "Guidance on Treatment of Product and Process Claim in light of *In re Ochiai, In re Brouwer* and 35 USC 103(b)," 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. **Failure to do so may result in loss of the right to rejoinder.**

Further, note that the prohibition against double patenting rejections of 35 USC 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP 804.01.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria B. Marvich, PhD whose telephone number is (571)-272-0774. The examiner can normally be reached on M-F (7:00-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach, PhD can be reached on (571)-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Maria B Marvich, PhD
Examiner
Art Unit 1633

/Maria B Marvich/
Primary Examiner, Art Unit 1633